

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JOCHIM KOCH

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Appeal No. 1999-2544  
Application No. 08/796,513

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HEARD: JANUARY 10, 2001

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Before FRANKFORT, NASE, and LAZARUS, Administrative Patent Judges.

LAZARUS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 19, which are all of the claims pending in this application.

We reverse.

BACKGROUND

The appellant's invention relates to a respiration humidifier (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

THE PRIOR ART

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Ebneth	4,201,825	May 6, 1980
Jackson	4,381,267	Apr. 26, 1983
Sumiyoshi	4,587,016	May 6, 1986
Lambert	5,462,048	Oct. 31, 1995
Garcera et al. (Garcera)	5,468,384,	Nov. 21, 1995
Zwaan et al. (Zwaan)	GB 2 223 694	Apr. 18, 1990
	(published British patent application)	

THE REJECTIONS

Claims 1 through 11 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

Claims 1 and 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jackson.

Claims 1, 2, 4, 6, 8 through 15 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert.

Claims 3 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of either Sumiyoshi or Garcera.

Claims 5, 7, 18 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of Ebneith.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejections, we make reference to the answer (Paper No. 16, mailed July 9, 1998) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 14, filed April 17, 1998) and reply brief (Paper No. 17, filed August 24, 1998) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations that follow.<sup>1</sup>

The 35 U.S.C. § 112 rejection of claims 1 through 11.

We do not sustain the examiner's rejection of appellant's claims 1 through 11 under 35 U.S.C. § 112.

The examiner, in rejecting claims 1 through 11 under the second paragraph of 35 U.S.C. § 112, states that "for

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<sup>1</sup> Pursuant to 37 CFR 1.83(a), claimed features are required to be shown in the drawing. Claim 1 recites an "electrical heating means for electrical heating said fibers on their outer circumferential surface" which is described at page 5 of the appellant's specification, however the drawing accompanying the specification does not show the heating means of claim 1. This matter should be addressed by the appellant and/or the examiner during any further prosecution.

electrical heating" in claim 1 is not clear. The examiner questions "[i]s it by the flow of heated water which is heated by an electric heating means flowing over the surface of the hollow fibers or by the wires embedded into the hollow fibers which connected (*sic*) to an electric heating means" (final rejection, page 2).

The appellant's response argues that a limitation covering two possibilities does not make a claim unclear if both possibilities are understandable and if the type of heating in the claims is clearly set forth (brief, page 5).

Initially, we note that the purpose of the second paragraph of Section 112 is to basically ensure, with a reasonable degree of particularity, an adequate notification of the metes and bounds of what is being claimed. See In re Hammack, 427 F.2d 1378, 1382, 166 USPQ 204, 208 (CCPA 1970). When viewed in light of this authority, we cannot agree with the examiner that the metes and bounds of claims 1 through 11 cannot be determined because of the alleged deficiency noted

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by the examiner. A degree of reasonableness is necessary. As the court stated in In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971), the determination of whether the claims of an application satisfy the requirements of the second paragraph of Section 112 is

merely to determine whether the claims do, in fact, set out and circumscribe a particular area with a **reasonable** degree of precision and particularity. It is here where the definiteness of language employed must be analyzed -- not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. [Emphasis ours; footnote omitted.]

Here, the examiner criticizes the use of the claim 1 terminology "for electrical heating," but we do not believe it can seriously be contended that the artisan would not understand that "for electrical heating" refers to the embodiments disclosed by the appellant's specification wherein it is described that each hollow fiber of the bundle is "directly heated electrically" and that "resistor wires are wound around the hollow fibers... or they are printed on or applied as strips or films,... with a metal used as a resistor

heater, and they are provided with corresponding current connections" (specification, page 5, lines 5-11).

In our view, one of ordinary skill in this art would understand the terminology "for electrical heating" when read in light of the specification. Accordingly, we find that "for electrical heating" is clear in the context of these claims and we will not sustain the examiner's rejection of appealed claims 1 through 11 under the second paragraph of 35 U.S.C. § 112.

The 35 U.S.C. § 102(b) rejection of claims 1 and 12

---Claim 1---

Claim 1 is directed to a respiration humidifier comprising a plurality of hollow fibers made of a material permeable to water vapor but impermeable to liquid water, a water feed connected to an outer jacket, breathing lines in connection with the interior of the fibers and "electrical heating means for electrical heating said fibers on their outer circumferential surface."

Jackson discloses a humidifier for a patient needing breathing support (col. 1, lines 12-15). The humidifier (50) comprises a bundle (10) of polysulfone fibers in a chamber (20) (col. 3, lines 48-50) having an inlet (21) and outlet (23) for water drawn by pump (P) from reservoir (40) through the space between the fibers with the water maintained at 105° F by a heater (42) in the reservoir (40). The humidifier (50) has a plenum (30) for air from a respirator (36) and a plenum (32) for air to the patient (col. 4, lines 4-27).

The appellant's only argument with respect to this ground of rejection is found on pages 6 and 7 of the brief wherein it is argued that "element 42 of Jackson... cannot electrically heat the hollow fibers... all actions taken by element 42 in Jackson are performed on water in reservoir 40. Element 42 therefore does not electrically heat hollow fibers and can not anticipate the electrical heating means of claim 1." The examiner recognizes that Jackson teaches the use of heated water for heating that is in direct contact with the outer

circumferential surface of the hollow tubes (fibers) (final rejection, page 5). The issue before us is whether Jackson's electrical heater element (42) is a teaching of an "electrical heating means for electrical heating of the hollow fibers on their outer circumferential surface," as recited in claim 1 on appeal (final rejection, page 3).

The "electrical heating means for electrical heating" of claim 1 is in means-plus-function format, and in accordance with 35 U.S.C. ' 112, paragraph 6, a means-plus-function claim "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." In accordance with the statutory mandate on how the means-plus-function clause is to be construed, we must consider the structure disclosed in the specification corresponding to such language when rendering a patentability determination. See In re Donaldson Co., 16 F.3d 1189, 1195, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994).

Our review of the appellant's disclosure reveals that the claimed electrical heating means for electrical heating said

fibers on their outer circumferential surface is described as "[e]ach hollow fiber of the bundle is directly heated electrically... [i]ndividual resistor wires are wound around the hollow fibers... or they are printed on or applied as strips or films..." (page 5, lines 5-11). This leads us to the conclusion that Jackson's heater element (42) which heats the water and not the fibers, does not teach or suggest, either expressly or inherently, corresponding or equivalent structure to appellant's electrical heating means for electrically heating the fibers on their outer circumferential surface as recited in claim 1 on appeal. Although Jackson's heating element (42) is an electrical heating means, it does not perform the function of electrical heating of the hollow fibers on their outer circumference as recited in claim 1. Rather, Jackson's heated water heats the fibers by conduction, not electrically. Accordingly, it is our opinion that one of ordinary skill in the art would not consider Jackson's heating element (42) to be an electrical heating means for electrical heating of the fibers on their outer circumferential surface, and for this reason we will not sustain the examiner's rejection of claim 1.

---Claim 12---

Claim 12 is directed to a respiration humidifier comprising a plurality of hollow fibers made of a material permeable to water vapor but impermeable to liquid water, a water feed connected to an outer jacket, breathing lines in connection with the interior of the fibers and "heating means for directly and substantially evenly heating an outer circumferential surface of said hollow fibers."<sup>2</sup> We proceed to determine the broadest reasonable interpretation of this latter limitation, the "heating means...", and find that such limitation is not taught or suggested by Jackson.

The appellant's specification at pages 4 and 5 discloses that

[i]t is essential for the present invention that the heater is arranged directly around the hollow fibers in the water bath in the jacket of the respiration humidifier, i.e., it is integrated in the humidifier module.... The

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<sup>2</sup> The appellant argues that heater element (42) in Jackson cannot represent the heating means of claim 12 because it only operates on the water in the reservoir and does not directly heat an outer circumferential surface of the hollow fibers as set forth in claim 12 (brief, pages 7 and 11).

basic objective of the present invention is to operate all hollow fibers at the same temperature in order to obtain an extensively uniform breathing gas temperature and humidity over the entire cross section of the humidifier module. Only this can guarantee an optimal utilization of every individual hollow fiber in terms of the release of humidity and heat. Individual fibers might otherwise be too cold and would have an insufficient humidification capacity, whereas others would be too warm and thus they would lead to excessive humidification capacity, as a result of which the humidity would again precipitate as a condensate. Each hollow fiber of the bundle is directly heated electrically according to the present invention. (emphasis ours)

Accordingly, we understand from the appellant's specification that a heating means as set forth in claim 12 on appeal is a heater arranged directly around and in contact with the outer circumferential surface, and extending along the length, of each of the hollow fibers in the water bath.

As noted above, the examiner has determined, and the appellant has recognized, that Jackson's water heats the fibers (brief, pages 5-6 and final rejection, page 5). It is our opinion that the appellant's "heating means" recited in claim 12 is not readable on Jackson's heated water which is

drawn through the space between the loosely-nested fibers  
(column 4, lines 28-  
29). Jackson's heated water is not a heater arranged directly  
around the hollow fibers in the water bath, it is the water  
bath itself. Also, Jackson's water bath does not perform the  
appellant's basic objective of operating all hollow fibers at  
the same temperature. It is our opinion that one of ordinary  
skill in the art would have understood that Jackson's heated  
water would have lost heat as it flows from the fibers nearest  
the inlet (21) to the fibers near the outlet (23) such that  
all fibers would not operate at the same temperature. In our  
view the appellant's description that it is essential that the  
heater is arranged directly around the hollow fibers in the  
water bath, and that the basic objective is to operate all  
fibers at the same temperature, serves to limit the  
permissible breadth of the heating means as recited in claim  
12. Accordingly, it is our opinion that Jackson does not  
perform the function of the heating means of claim 12, and we  
will not sustain the examiner's rejection of claim 12.

For the foregoing reasons we reverse the examiner's rejection of claims 1 and 12 as being anticipated by Jackson.

The 35 U.S.C. § 103(a) rejection of  
claims 1, 2, 4, 6, 8 through 15 and 17

---Claims 1 and 12---

As noted above, Jackson does not teach electrical heating means for electrically heating the fibers on their outer circumferential surface as recited in claim 1 on appeal and does not teach or suggest the heating means of claim 12 on appeal.

Zwaan teaches a water compartment (30) (Fig. 7) constructed from microporous sheet material (40) which is permeable to water vapor but substantially impermeable to liquid water with a heating element (50) inside of the sheet material (40) (pages 4-5). According to Zwaan's disclosure, electrical contacts (46) are connected to a preferred heating

element (50), which is a flat spirally wound element, so that if a plurality of turns of wire are partially exposed to air, then a lesser damaging effect is given compared with a whole turn (specification, page 6).

Lambert teaches a moisture exchange unit (12) (Fig. 1) having helically wound paper layers (13 and 15) (Fig. 3) and a warming device (16) of a band which includes one or more resistor elements wound with the paper layers (col. 2, lines 65-68 and col. 3, lines 1-10).

It is the examiner's opinion that it would have been obvious to one of ordinary skill in the art, in view of Zwaan and Lambert, to have modified Jackson's device by providing an electrical heating means for heating to generate vapor pressure within the device sufficient to cause passage of water vapor but not liquid water through the wall of the hollow tubes (final rejection, page 4).

In response to the appellant's argument that Zwaan does not teach direct electrical heating of the outer

circumferential surface of the fibers and Lambert does not teach or suggest hollow fibers (brief, page 8), the examiner argues, with respect to Zwaan, that it is not clear what would constitute an electrical heating means as claimed by the applicant and, with respect to Lambert's failure to teach hollow fibers, what would constitute a hollow fiber (answer, page 5).

Based on our analysis and a review of Zwaan and Lambert, it is our opinion that neither Zwaan nor Lambert teaches or suggests an electrical heating means for electrically heating the fibers on their outer circumferential surface as recited in claim 1 on appeal, or a heating means for directly and substantially evenly heating an outer circumferential surface of said hollow fibers as recited in claim 12 on appeal. Zwaan's heating element (50) is inside the water compartment (30) (Fig. 1) and, as suggested at, for example, page 1, lines 16-17 and at page 2 lines 9-10, the heating means is energizable to heat the water. Thus, Zwaan teaches using heated water to heat the interior of the microporous sheet and does not electrically heat the fibers as recited in the

appellant's claim 1, or heat the outer circumferential surface of the fibers, as recited in the appellant's claims 1 and 12.

Lambert's heating of paper layers is not at all a teaching or suggestion for heating hollow fibers on their outer circumferential surface as recited in claims 1 and 12. For these reasons, it does not appear to us that the suggested combination of these prior art references, as proposed by the examiner, would yield the apparatus defined in the appellant's claims 1 and 12 on appeal.

Also, Jackson discloses (Fig. 6) that in the humidifier the water vapor from the heated water permeates the thin walls of the fibers and humidifies the dry air flowing through the hollow fibers to saturation at body temperature which proceeds into the patient (column 6, lines 28-37). There is, thus, no necessity to modify Jackson, as the examiner suggests, by providing an electrical heating means for heating to generate vapor pressure within the device sufficient to cause passage of water vapor but not liquid water through the wall of the hollow tubes. For this reason, there is no basis for the examiner's suggestion to modify Jackson by providing an

electrical heating means and, thus, it does not appear to us that the suggested combination of these prior art references, as proposed by the examiner, would have been obvious to one of ordinary skill in the relevant art having the references before him.

Accordingly, we will not sustain the examiner's rejection of claims 1 and 12 as obvious over Jackson in view of Zwaan or Lambert.

---Claims 2, 4, 6, 8 through 11, 13 through 15 and 17---

The rejection of claims 2, 4, 6, 8 through 11 and 13, which are dependent on claim 1, and the rejection of claims 14, 15 and 17 which are dependent on claim 12, will not be sustained for the same reasons as with respect to claims 1 and 12.

The 35 U.S.C. § 103(a) rejection of claims 3 and 16

Claims 3 and 16 are dependent on claims 1 and 12, respectively. The rejection of claims 3 and 16 as being unpatentable over Jackson in view of Zwann or Lambert and further in view of either Sumiyoshi or Garcera will not be sustained for the same reasons as recited above with respect to claims 1 and 12, respectively. Sumiyoshi and Garcera are applied by the examiner for their teaching of the subject matter of claims 3 and 16 and they do not make up for the deficiencies noted above with respect to the rejection of claims 1 and 12 over Jackson in view of Zwann or Lambert. Sumiyoshi discloses using porous ceramic tubes (column 4, line 9) as a clarifying filter for collecting solid particles suspended in a slurry (column 1, lines 9-10), but does not teach or suggest an electrical heating means for electrically heating fibers on their outer circumferential surface (the deficiency noted above with respect to claim 1) or the heating means for directly and substantially evenly heating an outer circumferential surface of said hollow fibers (the deficiency noted above with respect to claim 12). Garcera discloses a filter module for filtering, separating, purifying gases or liquids, or for catalytic conversion comprising sintered glass

(column 2, lines 29-35), but does not teach or suggest an electrical heating means for electrically heating fibers on their outer circumferential surface (the deficiency noted above with respect to claim 1) or the heating means for directly and substantially evenly heating an outer circumferential surface of said hollow fibers (the deficiency noted above with respect to claim 12).

For these reasons we will reverse the examiner's rejection of claims 3 and 16 as obvious over Jackson in view of Zwann or Lambert, and further in view of either Sumiyoshi or Garcera.

The 35 U.S.C. § 103(a) rejection of claims 5, 7, 18 and 19

The rejection of claims 5 and 7, which are dependent on claim 1, and claims 18 and 19, which are dependent on claim 12, as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of Ebneith will not be sustained for the same reasons as recited above with respect to claims 1 and 12, respectively. Ebneith is applied by the examiner for

the teaching of the subject matter of claims 5, 7, 18 and 19 does not make up for the deficiencies noted above with respect to the rejections of claims 1 and 12 over Jackson in view of Zwann or Lambert. Ebneith discloses a metal-coated textile material and a process for its production (column 1, lines 4-5), but does not teach or suggest an electrical heating means for electrically heating fibers on their outer circumferential surface (the deficiency noted above with respect to claim 1) or the heating means for directly and substantially evenly heating an outer circumferential surface of said hollow fibers (the deficiency noted above with respect to claim 12).

Accordingly, the rejection of claims 5, 7, 18 and 19 as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of Ebneith is not sustained.

#### CONCLUSION

In summary, this panel of the Board has:  
reversed the decision of the examiner to reject claims 1 through 11 under 35 U.S.C. § 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention;

reversed the decision of the examiner to reject claims 1 and 12 under 35 U.S.C § 102(b) as being anticipated by Jackson;

reversed the decision of the examiner to reject claims 1, 2, 4, 6, 8 through 15 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert;

reversed the decision of the examiner to reject claims 3 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of either Sumiyoshi or Garcera; and

reversed the decision of the examiner to reject claims 5, 7, 18 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Jackson in view of Zwann or Lambert, and further in view of Ebneith.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

CHARLES E. FRANKFORT	)	
Administrative Patent Judge	)	
	)	
	)	BOARD OF PATENT
	)	APPEALS
	)	AND
	)	INTERFERENCES
	)	
RICHARD B. LAZARUS	)	
Administrative Patent Judge	)	

NASE, Administrative Patent Judge, dissenting-in-part.

I join in the reversal of the following rejections:

(1) claims 1 to 11 under 35 U.S.C. § 112, second paragraph,  
(2) claim 1 under 35 U.S.C § 102(b), and (3) claims 1 to 11,  
13 and 17 to 19 under 35 U.S.C. § 103(a). I respectfully  
dissent from my colleagues' reversal of the rejections of  
claim 12 under  
35 U.S.C. § 102(b) and claims 12 and 14 to 16 under 35 U.S.C.  
§ 103(a).

In my opinion, when the function of the heating means of  
claim 12 (i.e., "for directly and substantially evenly heating  
an outer circumferential surface of said hollow fibers" is  
given its broadest reasonable interpretation,<sup>1</sup> that function  
is met Jackson. As noted by the majority above, Jackson's  
water heats the fibers. It is my opinion that the function of

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<sup>1</sup> In proceedings before it, the United States Patent and Trademark Office (USPTO) applies to the verbiage of the claims before it the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the appellant's specification. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). See also In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983).

the appellant's "heating means" recited in claim 12 is readable on Jackson's heated water which is drawn through the space between the loosely-nested fibers (column 4, lines 28-29). In that regard, Jackson's heated water, while not performing the appellant's unclaimed basic objective of operating all hollow fibers at the same temperature, does directly and substantially evenly heat an outer circumferential surface of the hollow fibers. While the majority is correct that one of ordinary skill in the art would have understood that Jackson's heated water would inherently have lost some amount of heat as the heated water flows from the area of the fibers nearest the inlet (21) to the area of the fibers near the outlet (23) such that all areas of the fibers would not operate at the same temperature, it is my opinion that as the heated water flows from the area of the fibers nearest the inlet (21) to the area of the fibers near the outlet (23) at least an outer circumferential surface of one of the hollow fibers would inherently be directly and substantially evenly heated by the heated water. Thus, I read the claim 12 limitation of "an outer circumferential surface of said hollow fibers" as not requiring heating of all of the

outer circumferential surface of all of the hollow fibers. Rather, heating an outer surface of a fiber is sufficient. Accordingly, it is my opinion that Jackson does perform the function of the heating means of claim 12, and I would sustain the examiner's rejection of claim 12 under 35 U.S.C. § 102(b).

For similar reasons, I would sustain the examiner's rejection of claims 12 and 14 to 16 under 35 U.S.C. § 103(a).

	) BOARD OF PATENT
	) APPEALS
JEFFREY V. NASE	) AND
Administrative Patent Judge	) INTERFERENCES

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APPEAL NO. 1999-2544 - JUDGE LAZARUS  
APPLICATION NO. 08/796,513

APJ LAZARUS

APJ FRANKFORT

APJ NASE

DECISION: **REVERSED**

Prepared By:

**DRAFT TYPED:** 20 May 02

**FINAL TYPED:**